

Remarks

Applicant has amended claim 8-10 to more clearly define the present invention. In particular, each of the claims has been amended to make it clear that the intercalation compound according to the present invention has particle sizes of less than 100 nm.

It is respectfully requested that the present amendments be entered, and it is respectfully submitted that the amended claims clearly distinguish the present invention from the reference cited by the Examiner.

In particular, the Examiner has rejected claims 8 and 10 under 35 USC 102(b) as being anticipated by Peramunage et al. Further, the Examiner has rejected claim 9 under 35 USC 102(b) as being anticipated by or alternatively under 35 USC 103(a) as obvious over Peramunage et al. These rejections will be responded to together below, as the issues for each rejection are the same.

As noted above, the amended claims now require that the intercalation compound has particle sizes of less than 100 nm. It is abundantly clear that Peramunage et al fails to meet this limitation. In fact, as previously noted, Peramunage et al is specifically directed to the formation of intercalation compounds of "micron-size" (note the Title, Abstract, Introduction, etc. of Peramunage et al). At best, the SEM micrographs of Fig. 3 of Peramunage et al show particle sizes of no less than 700-900 nm. Clearly this is well above the particle sizes now required by the present claims. In this light, the amended claims can not be anticipated by nor found to be obvious over Peramunage et al.

Because the amended claims are so clearly distinguished from Peramunage et al, the further comments of the Examiner are considered moot and further discussion thereof is unnecessary.

Therefore, it is respectfully submitted that the present invention as defined by the amended claims is patentably distinct from Peramunage et al and it is respectfully requested that the all of the rejections, both under 35 USC 102(b) and under 35 USC 103(a) be withdrawn.

In view of the above amendments and remarks, early consideration and allowance of all pending claims, i.e. claims 8-10, are respectfully requested.

For the convenience of the Examiner and the USPTO, an appendix setting forth the status of all claims related to this application is attached. No amendment markings are shown in the appendix.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "David A. Hey".

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Version With Markings To Show Changes Made

8. A [nanostructure] particulate zero strain lithium titanate intercalation compound having particle sizes of less than 100 nm.

9. A [nanostructure] particulate lithium titanate intercalation compound having particle sizes of less than 100 nm synthesized by a method comprising:

providing a homogeneous mixture of co-reactant precursors comprising nanostructure TiO₂ and at least one thermolabile source of lithium ions;

heating said mixture rapidly to a reactive annealing temperature of about 750-800°C;

holding said mixture at said annealing temperature for a period of time not substantially longer than that required to effect the maximum available reaction of said mixed precursors in synthesizing said [nanostructure] intercalation compound particles of less than 100 nm; and

cooling said synthesized particles rapidly to a temperature below the reaction temperature required for the synthesis of said intercalation compound, thereby preventing further growth of said particles [while retaining said nanostructure].

10. A rechargeable electrochemical cell comprising:

a negative electrode member comprising a first electrochemically active material;

a positive electrode member comprising a second electrochemically active material; and

a separator member comprising an electrolyte interposed between said negative and positive electrode members;

wherein at least one of said active materials comprises a [nanostructure] particulate zero strain lithium titanate intercalation compound having particle sizes of less than 100 nm.

Appendix
Status of Claims

1. Withdrawn from consideration.
2. Withdrawn from consideration.
3. Withdrawn from consideration.
4. Withdrawn from consideration.
5. Withdrawn from consideration.
6. Withdrawn from consideration.
7. Withdrawn from consideration.

8. A particulate zero strain lithium titanate intercalation compound having particle sizes of less than 100 nm.

9. A particulate lithium titanate intercalation compound having particle sizes of less than 100 nm synthesized by a method comprising:
 - providing a homogeneous mixture of co-reactant precursors comprising nanostructure TiO₂ and at least one thermolabile source of lithium ions;
 - heating said mixture rapidly to a reactive annealing temperature of about 750-800°C;
 - holding said mixture at said annealing temperature for a period of time not substantially longer than that required to effect the maximum available reaction of said mixed precursors in synthesizing said intercalation compound particles of less than 100 nm; and
 - cooling said synthesized particles rapidly to a temperature below the reaction temperature required for the synthesis of said intercalation compound, thereby preventing further growth of said particles.

10. A rechargeable electrochemical cell comprising:
a negative electrode member comprising a first
electrochemically active material;
a positive electrode member comprising a second
electrochemically active material; and
a separator member comprising an electrolyte interposed
between said negative and positive electrode members;
wherein at least one of said active materials comprises a
particulate zero strain lithium titanate intercalation
compound having particle sizes of less than 100 nm.